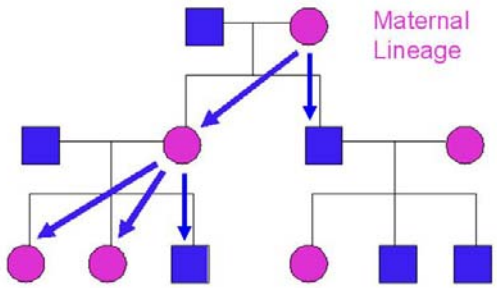
Genelex Laboratory #:19000-11
Participant: Jane Doe

Summary of Findings:
The results of the mtDNA sequencing test for Jane Doe found differences with the Cambridge Reference Sequence at positions 16298,16311, 195 and 263. The bases found at these positions are listed on your certificate.

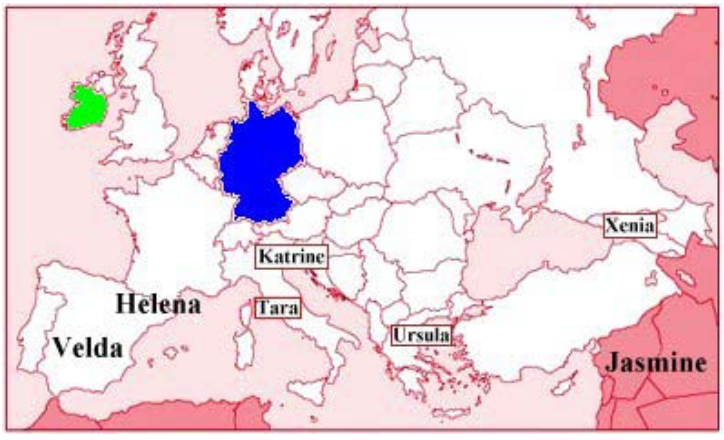
Results:



The mtDNA signature may be used to identify an individual and their direct maternal lineage. The mtDNA signature may also be helpful in identifying ethnic origins. Portions of the hypervariable region I and II from the mtDNA were amplified and sequenced from base pair positions 16100-16569 and 1-290 respectively. The mtDNA sequence data was compared to the Cambridge Reference Sequence. Any differences from the Cambridge Reference Sequence outside of the stated region will not be detected by using this test. This information was then referenced with current mtDNA haplogroup and archaeological information sources to provide a description of the origins of the maternal line.

Haplogroup Assignment: **V**

Haplogroup Description:
According to genetic theory, all humans descend from a woman nicknamed "African Eve." This unknown woman lived in Africa about 145,000 years ago (~5,700 generations). She was a very distant cousin of the Neanderthals, but unlike them, she was part of the *"Homo sapiens*" group and became an ancestor of all modern humans. She wasn't the only human female in her generation -- some scientists think that she belonged to a human population of about 2,000 people. The other women of her time certainly left daughters and granddaughters, but African Eve was the only woman in her generation whose descendants in the female line are still living today.



Geneticists divide African Eve's descendants into haplogroups popularly called "clans" to make the subject easier for lay people to understand. Different types of mtDNA correspond to different haplogroups. Currently, there are only 33 major haplogroups. Again, there

have been different maternal lines in existence in human history, but these are the only lines that can be found in existence today. You belong to haplogroup V, sometimes known as Clan Velda.

Haplogroup V, Clan Velda, is a European lineage and is thought to have originated in the limestone hills of Cantabria in northwest Spain about 17,000 years ago. Haplogroup V is derived from the ancient Haplogroup N. At that time, your clan shared the Iberian Peninsula (Spain, Portugal) and southwestern France with the clan of Ursula, a much older clan that had originated around Greece about 45,000 years ago.

About 13,000 years ago, your Clan appeared to migrate North around the strip of land to the West of the Pyrenees and into the plains of Gascony and slowly east over the next three centuries across France and into Britain and also into Northern Africa. Eventually, a few members of your clan edged up the still frozen seaboard of Norway to the far North where they joined pioneers from Arctic Russia to become the Lapps, or Saami, of northern Finland and Norway where they remain today.

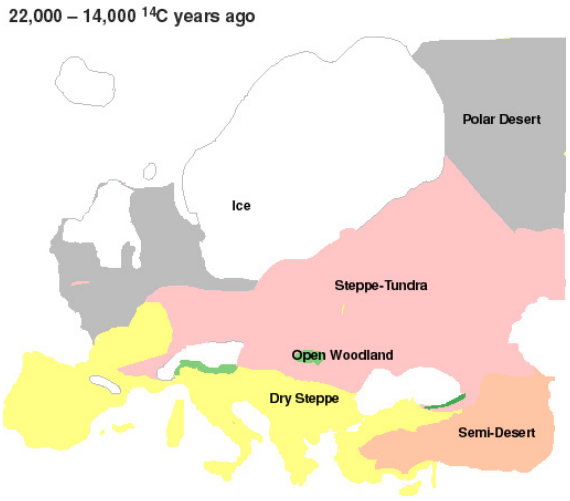
Paleolithic Era in Europe:

Prehistorical times are studied in three separate periods. Since the emergence of humans until 12,000 B.C., this first period is called the Palaeolithic Age (40,000 – 8,000 BC); this period is also named the Old Stone Age. The Palaeolithic Age which left only cave paintings, primitive stone tools, and monuments was followed by a transitional period between 12000 B.C. and 8000 B.C. called the Mesolithic Age or Middle Stone Age. This period also established the foundations for systematic organization of agriculture and cities during the Neolithic Age. The Neolithic Age emerged between 8000 and 2700 B.C. It is also known as the New Stone Age. This period was not experienced at the same time throughout the world. Continental Europe did not come into the Neolithic Age until much later after Asia Minor.

Early man made his greatest cultural progress at this time. The climate of the Paleolithic varied from cold steppe, or even Arctic tundra, to north temperate, similar to parts of Siberia and Canada of the present day. The hand axes and flake tools of the earlier assemblages were replaced by diversified and specialized tools made on blades struck from specially prepared cores. Many important inventions appeared, such as needles and thread, skin clothing, hafted stone and bone tools, the harpoon,

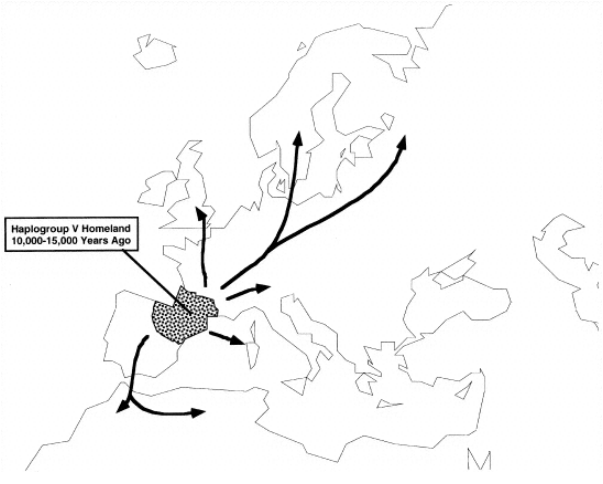
the spear thrower, and special fishing equipment. Bone, ivory, and antler, in addition to flint, were extensively used. The earliest man-made dwellings are found, consisting of semi subterranean pit houses. Of prime importance and interest is the beginning of the basic techniques of drawing, modeling, sculpture, and painting, as well as the earliest manifestations of dancing, music, the use of masks, ceremonies, and the organization of society into patterns that were apparently fairly complex. Indeed, the location of certain settlements suggests a more complex social life, including perhaps collective hunting. There is evidence for fertility magic, private property, and possible social stratification. Portable art was also developed including the most prominent type referred to as Venus figurines, sculptures of women commonly considered to have been used as ritual objects and possibly symbolizing fertility with their extremely exaggerated features. Body ornamentation was also developed including ivory beads, bracelets, carved bone pendants, and pierced shells and teeth.

Major Paleolithic Population Expansion from Southwestern Europe:



Scientists interpret the distribution of Haplotype V as expansions from isolated populations in the Iberian Peninsula and southern France following the last ice age. During the last ice age (20,000 to 13,000 years ago) Western Europe was isolated from Central Europe and humans were forced to vacate Central Europe with the exception of a refuge in the northern Balkans. The climate was extremely dry and cold. A reduction in the population of hunter-gatherers would have occurred during this time as people retreated south to warmed isolated refuges. After the climate warmed, about 14,700 – 12,600 years ago, your ancestors spread north and east.

Scientist believe that Clan Velda, Haplogroup V, contributed to the all the gene pools of all central and northern European populations. It now has a limited geographical distribution and in mainly observed in northwestern Europe and North Africa. The highest frequencies are observed in the Iberian Peninsula (Cantelonian 26%, Basque 20%), the Scandinavian Saami (40%) and the Berbers of North Africa (8%). Scientist's believe that a 'sparse wave' of hunter-gatherers migrating rapidly out of refugial areas would have made a disproportionate contribution to the genetic and



linguistic legacy of the region. Your clan was not the only group to migrate during this time. Your sister clans, Clan Helena, Haplogroup H, which originated in the Near East about 25,000 – 30,000 years ago, also took part in this expansion as did Clan Ursula, Haplogroup U. Clan Helena is the most frequent clan in western Europe (40-60%) and reaches the highest frequencies in the Basques (50-67%). The Paleolithic expansion of peoples from southwestern Europe may explain part of the initial prehistoric dispersal pattern of the Indo-European languages.

The Pasiegos people of Cantabria, one of the northern mountainous regions of Spain, have been shown to carry a high frequency of ancestral lineages of Haplogroup V (pre-V). The Pasiego are shepherds from Montes de Pas that seasonally move along the mountains carrying their livestock to the best pastures. This region is very isolated and Cantabria was rather impermeable to the numerous waves of invaders that successively colonized the Iberian peninsula until recent historic times. The Pasiego might have been very similar to your ancient clan and these finding suggest a focus for the origin of Haplogroup V. The prehistoric Basques, in contrast, lack Haplotype V.

About 40% of modern Saami belong to Haplogroup V. However, this high incidence of haplogroup is associated with a low genetic variation and is associated with the genetic sequencing positions 16298 when observed alone or in combination with 16153. The Saami are also associated the subset haplogroup U5b1b. It is likely that the Saami are descendent of a distinctive subset of Europeans.

Magdalenian culture in Southwestern Europe:
After the ice age, during the period of climatic warming (14,700 to 12,600 years ago), the Magdelenian industries similar to those of southwestern France began to spread into northern France, Belgium, the Rhine region, Bavaria, Moravia, Switzerland and Lower Poland. This is in agreement with the population distribution of Haplogroup V. The plants and animals were greatly unlike those which flourish in the area today and life was extremely different for your hunter-gatherer ancestors. This was an astounding 12,000 years before agriculture reached this area of Europe and the clans depended on comparatively dangerous hunting techniques.

Some of the most famous Paleolithic cave art locations are Altamira (Spain), Lascaux and Chauvet (France). These cave paintings and relief carvings are evidence of a great culture, the Magdalenian culture which developed at around 17,000 years ago during the Upper Paleolithic period and which most likely your ancestors helped to create and took part in. This art and tool tradition has been excavated from many cave sites in Northern Spain and Southern France. The site for which the culture is named, La Madeleine; along with the

Grotte des Eyzies; Limeuil; the cave site at Altamira, Spain; and various other sites depict the large game mentioned above and/or animals such as bears and occasionally human figures. The game was usually depicted on the cave walls as either wounded or pregnant. This is likely believed to have been created as a form of hunting magic, although when the predator animals were depicted such as the cave bear, it is believed that these were done for protection from the animal. Caves were the dwellings of humans in addition to prey animals such as bears and lions, and dangerous run-ins were possible with these vicious animals. In addition to caves having been dwellings, refuge was also found in rock-shelters as well as tents. There are over150 Paleolithic caves and open-air sites in the Cantabrian Peninsula where Haplogroup V is thought to have originated.

The art became much more sophisticated, covering the huge walls of the caves as the ice age was coming to an end from about 15,000 to 10,000 years before the present. This is viewed as having been significant because around that time the previously abundant game animals were either moving north as the ice melted or simply dying out and it would have become more essential to participate in the hunting magic. Some of the most original features of this Magdalenian Pyrenean art consists of stone-carvings (horses and bisons made from pink sandstone of Isturitz and Duruthy, western part of the Pyrenees) and hand-modelings as well as engravings of animals on clay discovered in the most remote areas of the Central Pyrenees caves (bisons of the Tuc-d'Audubert cave, of the Bédeilhac cave). This great art of hunters, brought to perfection by the Magdalenians, approximatively ends in 11 000 before present, with the end of Ice Age.

The Middle Magdalenian era (from 14 500 to 13 000) sees the development of the conquest and mastery of the territory. Tools also become more advanced during the Upper Paleolithic with a shown dependence on compound tools (tools which can be repaired as opposed to replacing the whole tool) such as detachable spear points. Ample evidence was also available for the first time of tools for making tools, such as burins which were used to produce tools out of materials such as antler and bone. This led to tools which could be more easily sharpened, were more durable, and were capable of producing clothing along with tents with greater ease. A large amount of the implements originated from two great regional base camps: Isturitz (Pyrénées-Alantiques) and Mas-d'Azil (Ariège). The Magdelian culture's end corresponded roughly with the end of the Ice Age and the loss of large game, all of which occurred around approximately 10,000 BC.

Neolithic Era of in Central Europe:

Your clan would have spread through Central Europe during the Neolithic period. Around 8000 BC, many human cultures became increasingly dependent on cultivated crops and domesticated animals to secure their supply of food. Some hunting-gathering groups developed more intensive techniques that permitted them to establish village-farming settlements. A sedentary life may have been made possible by abundant resources due to improved post-glacial climatic conditions, with a culture living from hunting, fishing and gathering, including the use of wild cereals. Tools were available for making use of cereals: flint-bladed sickles for harvesting, and mortars, grinding stones, and storage pits. The Mediterranean zone became the centre of the first cultural modifications leading from the last hunters and food gatherers to the earliest farmers. During the period of the Neolithic revolution (8000-5000 BC), agricultural techniques of production expanded from the Middle East to other areas of the globe where the climate permitted. The basis of life everywhere was subsistence farming, supplemented by some measure of hunting and fishing—fish being a source of food curiously neglected in western and central Europe during the earlier phases of the Neolithic. Everywhere the same cereals were cultivated, together with beans, peas, and lentils. Around the Alps, apples were eventually cultivated and utilized for the preparation of a sort of cider. Cattle raising, combined with hunting proved, to be the most productive pursuit among the deciduous forests; cultivation was relegated to an increasingly secondary place, until in the late Bronze Age when more efficient tools for clearing land became generally available. The earliest houses of central Europe were very large, up to 135 feet in length and large enough to accommodate a whole lineage or small clan together with stalled cattle and grain stores. These communal houses gave place to smaller two-roomed dwellings, 25 to 33 feet long, but still entered through one end. Finally in late Neolithic times clusters of one-roomed huts became the most widespread fashion. Around the Alps such two-roomed houses and, less often, one-roomed huts were raised on piles above the shores of lakes or on platforms laid on peat mosses. Neolithic art, except among the hunter-fishers of the taiga, was geometric and not representational. It is best illustrated by the decoration of pottery. Pots, which were always handmade, were painted in southeastern Europe.

This information is meant to give you a plausible snapshot of what life was like when and where your maternal line originated. It combines the results of ongoing archaeological, linguistic and genetic research. Because the study of human pre-history is not exact and must rely on assumptions, scientists may disagree about the best interpretation of existing knowledge. As additional research results become available our assumptions may be updated or change completely. Your maternal inheritance is a small part of your overall inheritance but provides you with one of the clearest earliest views of your ancestry. It's like finding an especially beautiful and informative artifact in the remains of an ancient village or campsite. Genelex hopes that this information has been exciting and informative to you. We are honored to have played a role in your search for your genetic ancestors.

Percentage of Population that are haplotype V:

Iberia
- Spain, Mixed - 5.97 %
- Spain, Basque (Guipuzcoa) 20.0%
- Spain, Cantalonian – 26.7%
- Portugese 3.7%

Central-northern Europe
- Saami -39.77%
- Scandanavia - 5.74%
- Germany - 5.12%
- Austria/Switzerland - 2.67%
- European/Russia - 4.19%
- France/Italy - 2.82%
- Italy, Northern Sardinia – 10.4%
- Italy, Tyrol – 4.3%
- Iceland - 1.71%
- Ireland - 7.03%
- Orkney - 1.32
- Scotland - 4.26%
- Switzerland – 5.4%
- England/Wales - 3.73 %
- Western Isles/Isle of Skye- 2.03%

Near East
- Bulgaria/Turkey – 0%
- Mixed Middle East – 0%
- Turkey – 1.0%

India – 0%

Siberia – 0%

Africa, Algerian Berber – 8.2%

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